For the development of the foregoing, the employment of pure carbon is required, dry pure air at 0° and steam with an energy content of 650° per kilogramme.
Taking into consideration an amount of 1 cubic metre gas, then will #+2/+#=l> from which one derives ^=1 — x -y . . . (a).
Further, according to formula (16), p. 31,
2+^—?\ and as no C02 is present,
(CO TT\ TT-"=) ' Zi & J
By combination of (a) and (6) it follows : (as C0=# and H— y) that
8-762 -=l-*-
These transposed give
or
y=8-27a- 1-135 . . . (c).
A further comparison between x and y furnishes the amount. of heat which would be liberated on its production and taken up by the gas at the moment of its origin. This quantity of heat admits of being derived from the above according to the formula
Q = heat content of the C gasified+l,283#— 2,585y
The heat content of 1 kilogramme C at 1,150° amounts as before given, to 313 calories. In estimating the quantity of C which is necessary for the production of 1 cubic metre of steam-air gas. it should be remembered that from 1 kilogramme C are yielded :
Air-gas . . . 5-36 cubic metres . . . (vide 10). Water-gas I. . . 3'72 „ ... do. p. 29.
Water-gas II. . . 5-58 „ ... do. p. 30.
As a mean thereof, about 5 cubic metres producer gas would result, and therefore for 1 cubic metre steam-air gas 0*2 C will be required, and a heat content of 313x0*2=63 calories will be brought into the reaction :-»ne. The expression for Q will consequently be :
, , , (d).